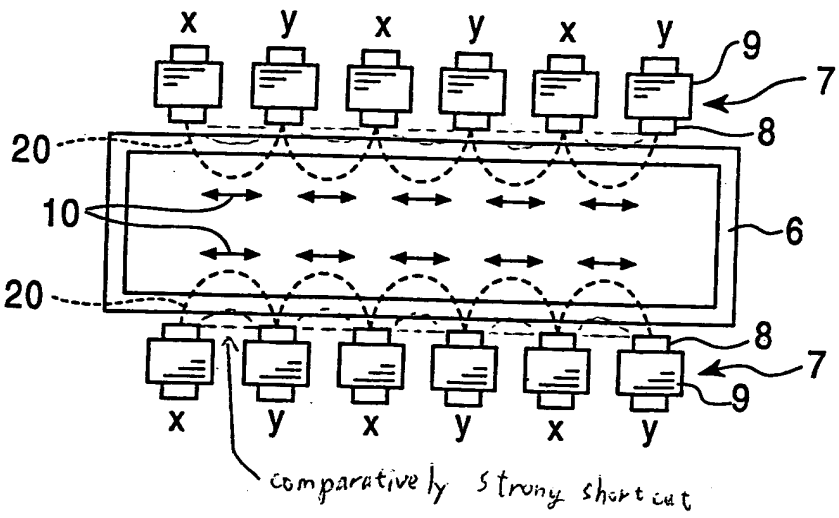
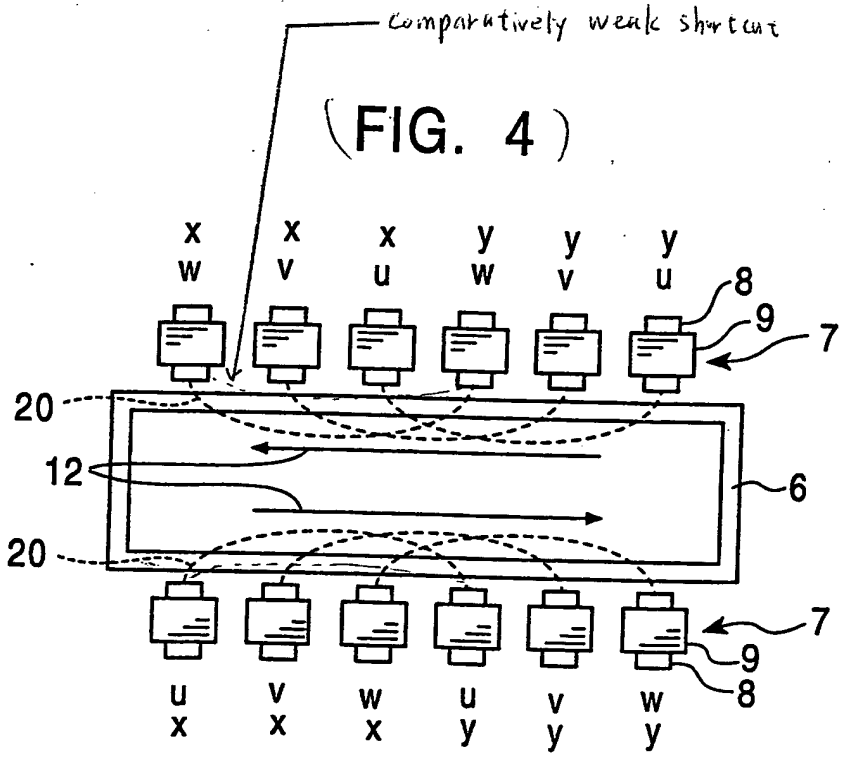
Figure.

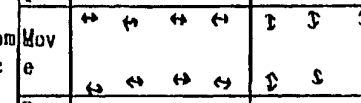
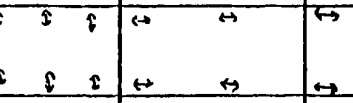
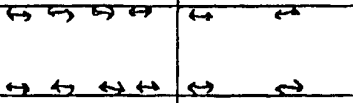
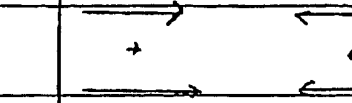
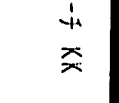
(FIG. 2)





(FIG. 4)

Reference Table

				This invention					
Objective movement of molten metal				Stirring without macroscopic circulation flow					
				Claims 1 to 6: Vibration			Claims 9 and 10: Vibration (enhanced)		Claim 17: Laminar macroscopic flow only near "surface" (flow is weak near "center")
Magnetic Field				Non-moving / Vibrating			Non-moving / Vibrating (Static field superimposed)		Moving (toward 'center') / Vibrating (static field superimposed)
Specific examples of embodiment	Example			F	G	H	I	J	K
	AC magnetic field	Type of AC		Single phase		Two phase	Single phase	Two phase	Three phase
		Arrangement of electromagnetic poles (degree)	Raw 1	0 /180/ 0 /180	0 / 0 / 0 / 0	0 / 90/180/270	0 /180/ 0 /180	0 / 90/180/270	0 / 60/120/(Center)/120/ 60/ 0
			Move						
			Raw 2	180/ 0 /180/ 0	180/180/180/180	180/270/ 0 / 90	180/ 0 /180/ 0	180/270/ 0 / 90	0 / 60/120/(Center)/120/ 60/ 0
	DC magnetic field			Non			Applied superimposedly		Applied superimposedly
	Note						By superimposed DC field, vibration (or flow) near "surface" is enhanced, while any flow near "center" is weakened		
	Disclosure			Fig. 2, etc. / pages 10 to 13	Fig. 3, etc. / pages 10 to 13	Not disclosed	Figs. 9, 11, etc. / pages15 to 20	Not disclosed	Figs. 13, 17, etc. / pages28 to 32
Effect				Avoid inclusions due to local vortex or stagnation, etc., by stirring without macroscopic circulation flow.					Avoid inclusions due to local vortex or stagnation, etc., by stirring with macroscopic non-circulation flow only at "surface".

'center' :center of the slab width direction
"center":center of the slab thickness direction
"surface":surface of the slab thickness direction

Reference Table (Continued)

					Conventional Technology		Fujisaki et. Al.		
Objective movement of molten metal					Macroscopic flow to stir molten metal		Uniform macroscopic flow to stir molten metal		
					Macroscopic circulation flow	Macroscopic non-circulation flow	Macroscopic circulation flow		Macroscopic non-circulation flow
Magnetic Field					Moving / Vibrating		Moving / Vibrating (advanced)	Moving / Vibrating (Partially static)	Moving (toward 'center') / Vibrating
Specific examples of embodiment	Example				A	B	C	D	E
	AC magnetic field	Type of AC			Three phase	Two phase	Three phase		
		Arrangement of electromagnetic poles (degree)	Raw 1		0 / 60/120/180/240/300	0 / 90/180/270	0 / 60/120/180/240/300	0 / 60/120/(Center)/ 〈 D C 〉	0 / 60/120/(Center)/120/ 60/ 0
			Move		→ / ←	↔ / ↔	→ → / ← ←	→ / ←	→ ← / → ←
			Raw 2		300/240/180/120/ 60/ 0	180/270/ 0 / 90	0 / 60/120/180/240/300	〈 D C 〉 /(Center)/180/240/300	0 / 60/120/(Center)/120/ 60/ 0
	DC magnetic field				Non	Non	Non	Applied separately (different block)	Non
	Note						Divided into plural blocks so as to control the strength of the magnetic field separeyively		
	Disclosure				Fig.4, page 12 (This Application) / Fig.3, columns 1 to 2 (Fujisaki et.al.)	Not Disclosed	Figs.6, 8, 9, 15, 16, 18, 20, 28, etc. / columns from 8	Fig.60A, etc. / columns from 29	Figs.51A to 51C, etc. / columns from 26
Effect					Avoid segregation and capture of inclusions at solidified shell, by stirring (Macroscopic flow which creates local vortex or stagnation makes above effect insufficient, and also causes entrainment of inclusions.)		Avoid segregation and capture of inclusions at solidified shell, by stirring (Same as conventional technology). Trying to achieve macroscopically uniform circulation (or non-circulation) flow. (Because of macroscopic flow, local vortex or stagnation is not sufficiently avoided, and said problems are not fully solved)		

'center':center of the slab width direction
"center":center of the slab thickness direction
"surface":surface of the slab thickness direction